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BENEFITS OF ADDITIVES USING IN OIL-REFINING INDUSTRY

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Development and application of additives for fuels in Russia and in the world is of great interest.Analysis of the situation in the development and use of additives for fuels shows that it is in direct proportion to the needs of the production of fuels that must meet the modern global requirements in terms of quality. From over forty well-known types of additives to the fore fore promoters of inflammation and anti-wear additives necessary to produce low-sulfur diesel fuels in the Euro-4 and above, multi-functional detergent additives to gasoline to Euro-3 and higher categories. Diverse climatic conditions of our country also require sufficient range of diesel fuels with satisfactory low-temperature properties.

Development of additives to prevent the formation of deposits in the combustion chamber is needed to maintain the cleanliness of the injectors, and, consequently, to reduce the growth requirements of the engine to the octane number of gasoline originating from the formation of soot in the combustion chamber. These additives are based on the composition of surfactants, which are combined with modifiers nagara (alcohols, esters, ethoxylated compounds) and combustion catalysts (compounds of iron, copper, manganese, rare earth elements). As the surfactant used compounds with high thermal stability.

Composition of additives that improves low-temperature properties of diesel fuels includes three types: direct depressors, dispersants paraffin and their compositions on a "two-in-one". Patented all types, but depressants are still to a greater extent. Own the same dispersant in Russia yet, now used dispersants are imported.

Additives that improve the flammability of motor fuels are divided into two types: antidetonators for gasoline and diesel fuel ignition promoters. After rejecting the use of tetraethyl lead in the production of motor gasoline kept the practical value antidetonators different chemical nature: organometallic compounds and compositions based on N-methylaniline. They patented mainly in Russia, Ukraine, China and other countries where the industry does not provide sufficient production of high gasoline fractions.

The use of metal-containing anti-knock does not approve of the World Fuel Charter. Russian specialists in January 2005 are also uniquely negatively commented on the additives of this kind. However, due to the huge commercial benefits of their use is still ongoing. More acceptable ashless anti-knock additive based on N-methylaniline.

For additives that improve combustion of fuel, we refer directly to the combustion catalyst and antidymnye antisazhevye additives. Combustion catalysts are designed primarily for boiler fuels based on residual fractions. Antidymnye additives based on compounds of barium and stopped to call the attention of developers are no longer used. There are several reasons: an increase in ash content ratio and filterability of diesel fuel with the introduction of additives, toxic compounds containing barium, and an increase in particulate emissions - oxides, carbonates and sulfates of metals. The aim is achieved by these additives - reducing the opacity of exhaust gases can be achieved by other means, such as maintaining optimal engine operation at the expense of timely maintenance and use of detergent additives.

Antisazhevye additives actually represent a catalytic combustion of soot. Metals (cerium, iron, copper) which form the basis antisazhevyh additives, most often injected into the fuel in the form of salts of carboxylic acids, adding ash-free detergents to improve the

stability of solutions. Such additives, introduced into the fuel, reduce the temperature of soot burning to a temperature of exhaust gases.

Anti-wear additives for low sulfur diesel fuel are very intensively developing area of research. This explains the practical importance of the problem and the fact that these developments started relatively recently and the number of potential technical solutions is far from exhausted. Composition of antiwear additives traditionally contains carboxylic acids, their derivatives, or different formulations based on them. It is possible to use other compounds, an important characteristic of which is the high surface activity and good adhesion to metal surfaces.

A special problem is the compatibility of additives in the fuel which can be up to 3 types. Experimentally established some additives are combined with each other badly. For example, the effectiveness of antiwear additives is reduced in the presence of depressants, promoter of inflammation and other additives, which are based on surfactants, competing with the antiwear additives for the surface. Thus, the need to develop packages of additives whose composition will depend on the characteristics and requirements of a particular fuel.

Motor oil contains additives.In actuality additives are used in most all lubricants, because even the best synthetic base oils cannot protect vital parts alone, as it's the additives that do all of the work. Let's concentrate on the internal combustion engine in looking at the need for additives. According to the American Petroleum Institute the powerful watchdog for the oil companies, "The temperatures and types of service under which an engine is operated vary markedly. Moderate-speed driving on short trips or stop-and-go driving in traffic uses only a fraction of the available engine power. Because the cooling systems must be capable of meeting the cooling requirements of the engine at high speeds, they may overcool the engine in short-trip driving. In such light-duty service engines and motor oils warm up slowly and often do not reach proper operating temperatures.

Under these conditions automatic chokes will provide the engine with the rich air-fuel mixture it needs to operate smoothly at cold temperatures, but this richness will result in incomplete combustion. Soot and partially oxidized hydrocarbons undergo further oxidation in the crankcase, forming sludge and varnish deposits. These may clog oil screens or plug oil rings, interfering with oil circulation and control, or they may cause hydraulic valve lifters and valves to stick. Corrosive acids are formed that cause wear on piston rings, cylinders, and occasionally on piston skirts. Steam from combustion condenses on cylinder walls and drains into the crankcase. Water, often in combination with acidic gases, may cause valve lifters to rust and stick. It may also create rust deposits on piston pins, rocker arm shafts, and valve stems. Liquid fuel leaking past the piston rings dilutes the oil and reduces its lubricating value. These are some of the effects of engine operation at cold temperatures.

In contrast legal speed limit driving and long trips allow the engine and oil to warm p properly. The choke is open, and the carburetor is feeding the cylinders with a lean, clean burning air-fuel mixture. As a result there little or no incomplete combustion to produce soot other residue. Under these conditions water compensation is not a problem, nor is dilution of the motor oil by raw fuel." Additives have been developed to address these problems as most of us qualify much of time for driving in severe service conditions. Furthermore, the API goes on to say "Under some conditions it is impossible to maintain a continuous oil film between moving parts, and there is intermittent metal-to-metal contact between the high spots on sliding surfaces. Lubrication engineers call this boundary lubrication. Under these circumstances the load is only partially supported by the oil film. The oil film is ruptured, resulting in significant metal-to-metal contact. When this occurs, the friction generated between the surfaces can produce enough heat to cause on or both of the metals in contact to melt and weld together. Unless counteracted by proper additive treatment, the result is either immediate seizure or the tearing apart and roughening of surfaces.